



## C. U. SHAH UNIVERSITY – Wadhwan City

**FACULTY OF:** Technology and Engineering (Diploma Engineering)

**DEPARTMENT OF:** Civil Engineering

**SEMESTER:** VI **CODE:** 2TE06HWM1

**NAME** –Hydrology and Watershed Management

**Teaching & Evaluation Scheme:-**

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme								Total
		Th	Tu	Pr	Total		Theory				Practical (Marks)				
							Sessional Exam		University Exam		Pr	TW	Pr	Tw	
							Marks	Hours	Marks	Hours					
2TE06HWM1	Hydrology and Watershed Management	04	00	02	06	05	30	1.5	70	03	---	20	30	--	150

**Objectives:** The students will be able to:

1. Apply integrated approach to watershed hydrology.
2. Apply techniques of soil and water conservation in watershed management.
3. Use rainwater-harvesting techniques.
4. Identify water harvesting structure.
5. Use peoples participation in local watershed management and development

**Pre-requisite:** basic knowledge of precipitation and rainfall analysis, evapotranspiration.

**Course Outlines:-**

Sr. No.	Course Contents	Teaching Hours
1	<b>Introduction to Watershed Hydrology ( Unused land + Economy+ Local people's Participation)</b> Hydrology and water resources in Gujarat state. Precipitation and Rainfall Analysis , Precipitation and interception, Evapotranspiration and soil storage, Infiltration and Evaporation , Surface runoff, and stream flow, Groundwater system, Land use hydrological impacts, Urban hydrology, Introduction to Meteorology (meteorology), Definition of watershed, concept of watershed, definition of watershed management, need of watershed management, Characteristics of watershed, objectives of watershed management, benefits of watershed development, Causes and effects of degradation, Integrated multi-disciplinary approach for watershed, steps in watershed management. Effects of urbanization on watershed management	10
2	<b>Water Harvesting</b> Definition, need of rainwater harvesting, advantages of rainwater harvesting,. Techniques of rainwater harvesting roof water harvesting and surface water harvesting (definition), Traditional methods of rainwater harvesting in Gujarat state. Roof water harvesting- techniques as storage and ground water recharge, components- catchment, coarse mesh, gutters, conduits, first flushing, filters, storage facilities, recharge structures.	10
3	<b>Biomass Management</b> Major intervention areas for biomass management are indicated below; Eco-preservation, Biomass Regeneration, Forest Management & conservation, Plant Protection & Social Forestry, Increased Productivity of Animals, Income & Employment Generation Activities, Coordination of Health & Sanitation, Awareness of Bio Mass Energy and its conservation, Good practices for crop/cattle farming ; Cleaner, Production	10

4	<b>Water Harvesting Structures</b> Types of watershed structures- such as small weir, Gully plugging, Khet talavadi, weir, percolation tank, jalbandh, farm pond and check dam. Details of watershed structure with neat sketch. Design Considerations of water shed projects. Ground water dykes or sub surface dykes	10
5	<b>Socio Economic Aspects:</b> People's awareness, participation and response. State integrated approach. Sustainable society for economical upliftment. Economics of watershed project	05

**Term Work:** - It is find to the sketch of types of watershed structures, farm and pond check dam.

**Learning outcomes:** water harvesting structures are learn to the develop to the weir, gully plugging, khet talavadi pond and check dam. The subject Watershed Management aims to attempt development of watershed in the Indian context and particularly considering the need of Gujarat state. It aims at actual identifying ideal water harvesting and soil conservation structure situated to a particular topography. The input to the subject is the knowledge of Survey and Geotechnical engineering which helps in deciding the stability of topography and soil for successful implementation of watershed, hydrology for parameter associated with rainfall and runoff.

**Books Recommended:-**

1. Irrigation, Water Resources Dr. P.N. Modi Standard Book House, & Water Power Engg. Delhi.
2. Hydrology & Water Resources R.K. Sharma Dhanpat Rai & Sons, Delhi.
3. Ground water H.M.Ragunath New Age international Ltd., New Delhi.
4. Ground water assessment, K.R. Karanth Tata Mc Graw Hill Development & management Pub. Co. Ltd., New Delhi.
5. Principle & Practice of Irrigation S.K.Sharma S.Chand & Co, Delhi. Engg.
6. Hydrology & Water Resources Engg. S.K.Garg. Khanna Pub., Delhi.
7. Watershed management in India J.V.S. Moorthy Willey Eastern Ltd. New Age international Ltd., New Delhi.
8. Design of small dams. U.S.B.R.
9. Irrigation theory & practice A.M.Mitchel Vikas Pub. House Pvt. Ltd, Delhi.
10. Water vision 2050 Narmada, W.R. & water supply deptt. Gandhinagar